

New building

Refurbishment

Heat loss: 4 kWh per m<sup>2</sup> and heating season



Primary energy (non renewable): >17 kWh/m<sup>2</sup>



Green house gas potential: -3,1 (?) kg CO<sub>2</sub> Äqv./m<sup>2</sup>

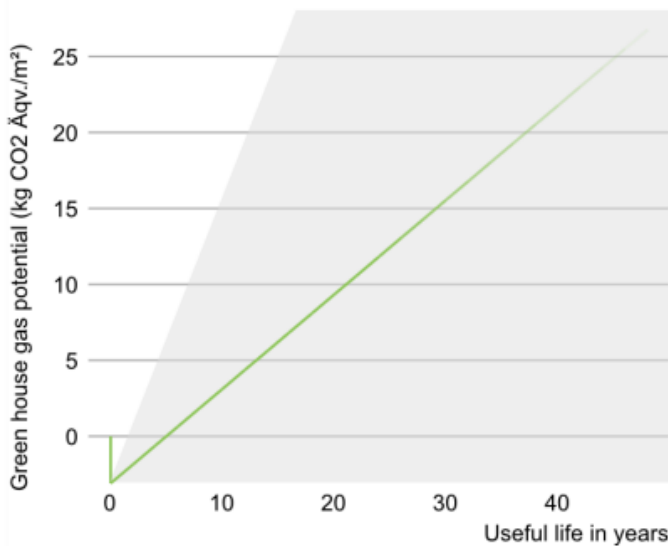


Amount of heat that escapes through one square meter of this component during the heating period. Please note: Due to internal and solar gains, the heating demand is lower than the heat loss.

Non-renewable primary energy (= energy from fossil fuels and nuclear energy) that was used to produce the new building materials ("cradle to gate").

For the production of the building materials used, more greenhouse gases were withdrawn from the atmosphere than emitted.

## Green house gas potential



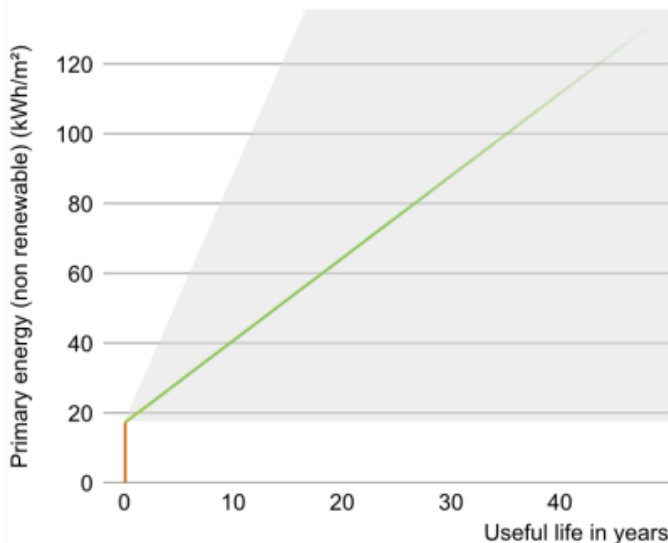
The **left figure** shows the global warming potential of the production of the component in the vertical part of the curve. Greenhouse gas emissions (through heating) arising during use of the building are indicated by the upward curve.

The **figure at the bottom left** shows the non-renewable primary energy expenditure for the production of the component in the vertical part of the curve. The primary energy required during use of the building (through heating) is represented by the upward curve.

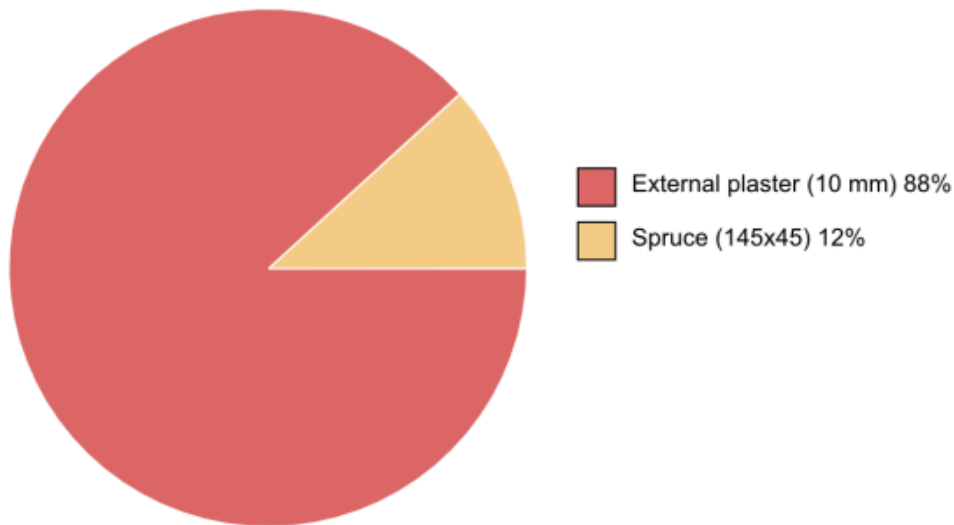
The longer the component is used unchanged, the more environmentally friendly it is, because the production costs contribute less to the total emissions (indicated by the color of the curve).

Due to unknown solar and internal gains, the heating demand can only be estimated. Accordingly, primary energy consumption and global warming potential during the use phase are only vaguely known. For the estimation it was assumed that solar and internal profits contribute with 4 kWh/a/m<sup>2</sup> component area. The light gray area indicates the area in which the curve is located with great certainty. For heat generation, a primary energy input of 1,8 kWh per kWh of heat and a global warming potential of 0,47 kg CO<sub>2</sub> eqv/m<sup>2</sup> per kWh of heat was used. Heat source: Electricity (electric heating).

## Primary energy consumption



## Composition of non-renewable primary energy input for manufacturing



## Composition of the global warming potential of production in kg CO<sub>2</sub> eq/m<sup>2</sup>



A negative global warming potential (green bars to the left) means that more greenhouse gases have been extracted from the atmosphere than produced, usually through the growth of renewable raw materials.

### Other environmental product data for the manufacture of this component:

Summer smog (POCP):	0,0027 kg Ethen-Äqv./kg
Acidification potential (AP):	0,012 kg SO <sub>2</sub> -Äqv./kg
Eutrophication potential (EP):	0,0024 kg Phosphat-Äqv./kg
Ozone depletion potential (ODP):	0,0000000058 kg R11-Äqv./kg

**Attention:** At least one shift could not be considered because its environmental product data is unknown. See table on the tab 'Renovation'.

### Hints

The calculation is based on monthly average temperatures. Source: Ubakus

Note the difference between heat loss and heat demand: Because of solar and internal heat gains, the heat demand is less than the heat loss. Use the [heat demand calculator](#) to calculate the **heat demand** of a room or building. The heat demand calculator also takes into account ventilation losses as well as internal and solar gains.

Ideally, the LCA should also include the disposal of building materials after their end of life. With lifetimes of 30, 40 or more years, however, it is not foreseeable today what kind of damage or benefit the disposal will pose. For this reason, the disposal is not considered here.

The financial and environmental impact of a **refurbishment**, a tabulation of environmental data and uncertainty information can be found on the [next page](#).

You will find many more information on life cycle assessment in the article [So bauen Sie mit gutem Gewissen – trotz Klimawandel](#). Explanations on environmental product data can be found in the article [Umwelt-Produktdeklarationen verstehen und verwenden](#).

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Non-renewable primary energy (= energy from fossil fuels and nuclear energy) that was used to produce the new building materials ("cradle to gate").

#### Greenhouse gas potential: -3,1 (?) kg CO<sub>2</sub> Äqv./m<sup>2</sup>

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#### Green house gas potential

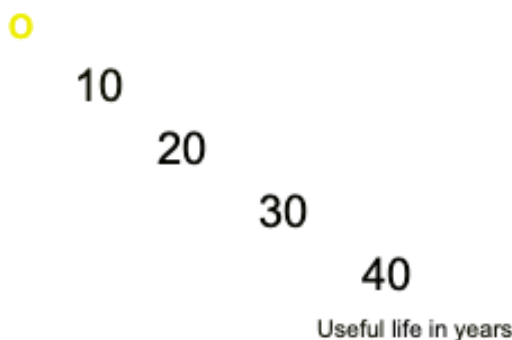
The left figure shows the global warming potential of the production of the component in the vertical part of the curve. Greenhouse gas emissions (through heating) arising during use of the building are indicated by the upward curve.

#### Green house gas potential (kg CO<sub>2</sub> Äqv./m<sup>2</sup>)

The figure at the bottom left shows the non-renewable primary energy expenditure for the production of the component in the vertical part of the curve. The primary energy required during use of the building (through heating) is represented by the upward curve.

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Accordingly, primary energy consumption and global warming potential during the use phase are only vaguely known. For the estimation it was assumed that solar and internal profits contribute with 4 kWh/a/m<sup>2</sup> component area. The light gray area indicates the area in which the curve is located with great certainty. For heat generation, a primary energy input of 1,8 kWh per kWh of heat and a global warming potential of 0,47 kg CO<sub>2</sub> eqv/m<sup>2</sup> per kWh of heat was used. Heat source: Electricity (electric heating).

## Primary energy consumption

Primary energy (non renewable) (kWh/m<sup>2</sup>)

